

## AMENDMENTS TO SPECIFICATION

Page 4, line 11 to Page 5, line 3:

When quantizing the LSP parameters with such VQ, most of quantizers have a large LSP codebook. And, in order to reduce computational complexity in searching an optimal code vector in the codebook, the quantizer decreases a range of codes to be searched by using an order of the LSP ~~counts~~ parameters. That is, the quantizer arranges the code vectors in the codebook for a target vector in a descending order according to element values in a specific position in a sub-vector. Then, the optimal code vector, which minimizes distortion in the arranged codebook, has nearly identical value with that of the target vector, which implies that such value has an order character. Under such presumption, the present invention compares an element value of a specific position arranged in a descending order with element values of other adjacent positions, and then calculates distortion with high computational complexity for the code vectors, which satisfies the order character, and cancels the calculation process for other code vectors.

Page 5, lines 6-14:

FIG. 1 shows a structure of a general SVQ. As shown in the figure, the target vector, or LSP vector ( $\mathbf{p}$ ) satisfies the below order character.

[Equation 1]

$$0 < p_1 < p_2 < \dots < p_p < \pi$$

[Equation 2]

$$[[\mathbf{E}_{l,m} = (\mathbf{p}_m - \mathbf{p}_{l,m})^T \mathbf{W}_m (\mathbf{p}_m - \mathbf{p}_{l,m})]]$$

$$\mathbf{E}_{l,m} = (\mathbf{p}_m - \mathbf{p}_{l,m})^T \mathbf{W}_m (\mathbf{p}_m - \mathbf{p}_{l,m})$$

$$0 \leq m \leq M - 1$$

$$1 \leq l \leq L_m$$

where  $l, m$  in the subscript of  $\mathbf{E}_{l,m}$  are indices that represent the  $l$ th index of the  $m$ th codebook, *i.e.*, the letters “ $l$ ” and “ $m$ ,” and

where superscript T designates the transpose of  $\{\mathbf{p}_m - \mathbf{p}\}_{l,m}$  for purposes of determining the dot product of  $\{\mathbf{p}_m - \mathbf{p}\}_{l,m}$  and  $\mathbf{W}_m \{\mathbf{p}_m - \mathbf{p}\}_{l,m}$  in order to calculate the least-mean-square error  $E_{l,m}$ .

Page 12, line 11 to Page 13, line 3:

Assuming that a codebook vector of an index (k) is  $c_k$ , an optical code vector is selected as a codebook vector, which maximizes the following Formula 8.

[Equation 8]

$$\left[ \left[ T_k = \frac{C_k^2}{E_k} = \frac{(d^T c_k)^2}{c_k^T \Phi c_k} \right] \right]$$

$$\underline{T_k = \frac{C_k^2}{E_k} = \frac{(d^T c_k)^2}{c_k^T \Phi c_k}}$$

in which  $\mathbf{d}$  is a correlation vector between the object signal  $\mathbf{x}'(\mathbf{n})$  and an impulse response  $\mathbf{h}(\mathbf{n})$  of a composite filter, and  $\Phi$  is a correlation matrix with  $\mathbf{h}(\mathbf{n})$ . That is,  $\mathbf{d}$  and  $\Phi$  are represented with the following Formulas 9 and 10.

[Formula 9]

$$d(n) = \sum_{i=n}^{39} x'(i)h(i-n) \quad i = 0, 1, \dots, 39$$

[Formula 10]

$$\Phi(i, j) = \sum_{n=j}^{39} h(n-i)h(n-j) \quad i = 0, \dots, 39 ; j = i, \dots, 39$$

Page 19, lines 5-9:

In other words, the step T110 compares the correlation value magnitudes obtained for all pulse position indexes of the track  $[[1]] \ 0(t_0)$  and then arranges the correlation values in a descending order. The step T110 executes an arrangement for the tracks 1 and 2 in a descending order by using the same approach.